

**WHAT IS CLAIMED:**

1. A method for regenerating a tissue or organ in the body of a mammal by transdifferentiation, wherein said tissue or organ is damaged due to injury or is missing, comprising the steps of:

(a) dedifferentiating the cells at the site of injury by administering a dedifferentiating effective amount of an agent selected from retinoids, 12-O-tetradecanoylphobol-13 acetate, 0.1 M hydrochloric acid (pH<5), hypertonic saline (saturated NaCl), a copper chelator selected from triethylenetetramine tetrahydrochloride, and heavy metals selected from copper, zinc and cadmium;

(b) transdifferentiating said dedifferentiated cells of step (a) by contacting said cells with a transdifferentiation-effective amount of transdifferentiating agent selected from inositol, zinc acetate, guanosine, phenylthiourea, 12-O-tetradecanoylphobol-13 acetate, guanosine monophosphate, guanosine diphosphate, guanosine triphosphate, adenosine, adenosine monophosphate, adenosine diphosphate, adenosine triphosphate, uridine, uridine monophosphate, uridine diphosphate, uridine triphosphate, thymidine, thymidine monophosphate, thymidine diphosphate, thymidine triphosphate, epinephrine and nonrepinephrine;

(c) stabilizing said transdifferentiated cells of step (b) by administering a stabilizing effective amount of an agent selected from beta-carotene, retinoids, riboflavin and pteridines thereby stabilizing said transdifferentiated organ or tissue.

2. The method of claim 1 wherein said dedifferentiating step (a) is performed by a method selected from repeated sticks with a needle at the site of injury or damage, surgically opening the site of injury or damage and subjecting the site of injury or damage to a laser burn.

3. The method of claim 1 wherein said dedifferentiation step (a) is performed by physically or enzymatically separating the cells in said tissue or organ.

4. The method of claim 1 wherein said tissue or organ is selected from lens, retina, pancreas, and liver.

5. A method for regenerating mammalian tissues or organs comprising the steps of:

(a) surgically opening an organ or tissue to be regenerated, producing dedifferentiated cells;

(b) contacting said dedifferentiated cells of step (a) with an amount of guanosine, effective for transdifferentiation thereby causing transdifferentiation of said dedifferentiated cells produced in step (a);

(c) contacting said cells from step (b) with an amount of beta-carotene effective for stabilization thereby causing stabilization of transdifferentiated cells produced in step (b); thereby producing stabilized, transdifferentiated cells.

6. The method of claim 5 wherein said transdifferentiating agent and said stabilizing agent are added simultaneously.

7. The method of claim 5 wherein said stabilizing agent is administered systemically.

8. The method of claim 7 wherein said agent is administered by a route selected from oral, enteral, by inhalation, topical, by aerosol and rectally.

9. The method of claim 5 wherein the agent in step (b) which causes transdifferentiation is the same agent which causes stabilization in step (c).

10. The method of claim 9 wherein said agent is retinoic acid.

11. The method of claim 9 wherein said agent is guanosine.

12. The method of claim 5 wherein said cells are from the lens.

13. The method of claim 5 wherein said cells are from the retina.